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SPRING HOUSES OF MONTGOMERY TOWNSHIP, PENNSYLVANIA: HISTORICAL, LOCATIONAL, AND ARCHITECTURAL PATTERNS OF AN EARLY SETTLEMENT CULTURAL ARTIFACT

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ABSTRACT: *Pennsylvania's key location of initial European settlement has helped to develop it as a vernacular geographic region with a rich historic landscape. Many geographic studies have inventoried and categorized the cultural characteristics of features such as barns and covered bridges. However, one unique type of structure, the spring house, was vitally important to early pioneers yet has been overlooked in research. This study utilized GIS and field research to identify, map, inventory, and describe the architectural components of thirty-three spring houses in Montgomery Township, Pennsylvania, to determine if their locations are correlated to historical land settlement patterns or environmental factors. Montgomery Township was selected for this study as it maintains much of its rural characteristics that has not succumbed to the pressures of current development, and it appears that a large number of spring houses have survived in comparison to the neighboring areas. By gaining a better understanding of their location, current condition, connection to historical ethnic patterns, and environmental factors, this study aims to increase awareness of their existence, lay the foundation of their importance during eighteenth and nineteenth century, and promote their preservation.*

Keywords: *historic settlement, spring houses, Franklin County, GIS*

INTRODUCTION

The rural Pennsylvania landscape is well known for its rolling valleys, fertile soils, and flowing rivers set amongst the backdrop of forested mountains. Historic stone houses, architecturally unique barns, and covered bridges dot the landscape. Along with this natural beauty, Pennsylvania's key location of initial European settlement and westward expansion helps to develop it as a vernacular geographic region.

Traditional cultural geography (Kniffen, 1965) laid the groundwork for identifying artifacts remaining in the landscape as important for defining regions. Numerous geographic studies (Ensminger, 1992, Delony, 2004, and Drake, 2009) have inventoried and categorized the cultural characteristics of features such as barns and covered bridges and demonstrate their importance to early settlement patterns in Pennsylvania. While 'new' cultural geography trends (Cosgrove and Jackson, 1987) interpret urban landscapes as active reflections of political and economic situations, this study attempts to reaffirm with modern analytical techniques that rural material artifacts can still define regions. One unique type of structure, spring houses, were vitally important to early pioneers and have been overlooked in research. Using GIS to map and inventory spring houses may add another interesting piece to the cultural diversity and the environmental resources of the area and contribute to the appreciation of the region.

The purpose of this study is to use GIS to identify, map, inventory, and describe the architectural characteristics of spring houses in Montgomery Township, Pennsylvania, and determine if their locations are correlated to historical land settlement patterns or environmental factors. Montgomery Township was selected for this study as it maintains much of its rural characteristics that have not succumbed to current development pressures, and during initial site visits, it appears that a large number of spring houses have survived in comparison to some of the neighboring areas. By gaining a better understanding of their location, and their connection to historical ethnic patterns and environmental factors, this study aims to increase awareness of their existence, lay the foundation of their importance during eighteenth and nineteenth century, and promote their preservation.

EARLY SETTLEMENT PATTERNS WEST OF THE SUSQUEHANNA

In 1681, William Penn acquired land from the King of England and established a colony with liberal provisions, religious tolerance, and economic opportunities for immigrants from many parts of Europe (Klett, 1948). Settled lands in Philadelphia, Bucks, Chester, and Lancaster Counties were more established, and thus lands to the west were cheaper and available to new immigrants. Lands west of the Susquehanna River began to see European settlement beginning in the 1730s with Cumberland County established in 1750 and Franklin County established in

1784. Outside influences in Europe such as cold winters, bad harvests, and famine brought waves of settlers to the New World (Conrad, 1971). Local conflicts with Indians (Ross and Marr, 2008) west of the Susquehanna impacted the demographics of the Cumberland Valley with increasing numbers of Germans and English supplanting the original Scots-Irish settlers.

In this pioneer period, Cumberland County was the western frontier, and settlers moved in faster than the government could regulate. Land ownership was a multi-step process (Barner, 2009). It involved making an initial partial payment, acquiring a warrant, completing a land survey, and finalizing a second payment, which led to a granted patent and eventually an official deed. A lack of records, along with minimal incentives for settlers to complete each step of officially acquiring the land limits our knowledge of exact dates, settlement and ethnicity of each property owner. Despite these limitations, Eschenmann and Barner delineated the original property boundaries of early settlers along with date or warrant and deed in a collection of maps entitled "The First Families of Old Cumberland County."

Pennsylvania's historical landscape is diverse and constituted a geographic unit unlike other parts of the New World (Havens, 1975). In New England and Virginia, the population was predominantly Anglo-Saxon, whereas Penn's policies led to a diverse mixture of English, Germans, Swiss, Dutch, Scots-Irish, and Welsh settlers who held a variety of religious beliefs living in close proximity to each other. Drake (2009) inventoried existing barns and their architectural styles in Monroe County, Pennsylvania, to determine European cultural patterns while Ross and Marr reviewed tax records from 1765-1775 to determine differences between settlement practices of early immigrants from different European countries. Although scarce, studies of the cultural landscape west of the Susquehanna River indicate unique landscape patterns and vernacular structures. McMurry (2009) demonstrated how multiple families legally shared barns and fields often with related kinship shaping the region's economy with Old World traditions.

Self-sufficient and commercial agriculture was vitally important to the early settlers, as is evident with the prominent barn that still dominates the rural Pennsylvania landscape, and thus it is not surprising that a long line of literature documents their location, classification, and preservation (Ensminger, 1992). However, equally important to a pioneer's survival is the existence of available water. While some may have dug wells (Eschenmann, 1997), and certain groups such as the Scots-Irish preferred to settle along waterways, the survival of spring houses in some areas suggest possible cultural and environmental patterns. A spring house is a small building located near a river, creek, or natural spring. Spring water is naturally cool, providing a constant water source and a means of long-term storage of perishable foods. Concentrations of spring houses, in certain parts of south-central Pennsylvania, dot the landscape and add to the diverse cultural heritage of the region.

THE PHYSICAL AND HISTORICAL GEOGRAPHY OF MONTGOMERY TOWNSHIP

Montgomery Township, located along the southern edge of Franklin County, Pennsylvania, shares much of the same history as other lands west of the Susquehanna River (Figure 1). The township sits within the middle section of the Great Valley, which runs from New York to Alabama and is bounded by South Mountain and Blue Ridge Mountain. The Valley is approximately 22 miles wide near Montgomery Township and falls within the Conococheague

Figure 1: Location of Montgomery Township,
Franklin County, Pennsylvania and its watersheds

watershed. Several small watersheds such as Bull Spring Creek, Licking Creek, Little Conococheague Creek, Welsh Run, and West Branch Conococheague flow into the Conococheague River to make it the second largest, non-tidal river that flows into the Potomac. This area was very important to early settlers as a water supply and for transportation of their goods to the eastern seaboard (Guzy, 2003).

Montgomery Township's topography is mostly gently rolling hills ranging between 500 to 700 feet in elevation. The difference in local relief and the surrounding mountains is a result of different carbonates and shales that erode more easily than the adjacent sandstones and quartzites (Shirk, 1980) and leave behind a relatively flat valley, ideal for farming. Prevalence of limestone provides fractures for natural springs that created a valuable water source for the settlers, along with lime to fertilizer crops. The silty loam soil in much of the valley had very few rocks and would have been most preferred to cultivate using colonial tools.

Montgomery Township was initially part of Cumberland County and would have experienced similar settlement patterns recorded throughout the valley. David Davis emigrated from Wales and purchased a tract along Welsh Run in 1736, and was followed by others from his home country to establish the Welsh Run settlement. Similar to the neighboring towns of Greencastle, Mercersburg, and Chambersburg, the lands originally used by the Indians began to see waves of settlers moving into the area from the 1730s onwards (Eschenmann, 1997). Most settlers were self-sufficient farmers and had fruit trees, vineyards, and livestock, with the grist mill becoming the most prominent industry. A study by Marr (2004) investigating the demographics of the region between 1750 and 1790 found that the male-female ratio changed from 60/40 to 50/50 over that given time period, with an average life expectance of 67.6 years. Also, based upon surnames of the grave markers, Marr determined that the ethnicity of the area was approximately 39% English, 31% German, 27% Scottish, 1% Irish, and 1% French. Over the same time period, Germans increased rapidly during the 1750s whereas Scots-Irish declined after 1760s. Each ethnic group tended to settle in different areas, with the Scots-Irish clustering near towns, the Germans in the rural countryside, and the English evenly distributed.

This physical geography and diverse mix of immigrants have been maintained in the rural agricultural community that still exists in Montgomery Township. Historic limestone homes and the cultural diffusion of barn styles are prominent on the rolling topography. This study aims to draw attention to spring houses in the region by using GIS to identify, map, and record the architectural components and determine if environmental or cultural patterns correlate to their presence. In a time when the importance of preserving historic barns and bridges is being recognized (Delony, 2004), this research chronicles spring houses to bring recognition to their importance and encourage preservation of a representative sample.

MAPPING AND INVENTORYING SPRING HOUSES IN MONTGOMERY TOWNSHIP

In order to map and inventory existing spring houses, a GIS database was established with key reference features such as roads, rivers, tributaries, township boundaries, and aerial imagery of the Cumberland Valley. In order to evaluate the remaining spring house locations with historical settlement and environmental factors, features such as the early settlement land tracts, geology, soils, and elevation were also added into the GIS.

Recognizing that spring houses are located near old farm houses and barns, the initial phase recorded potential buildings while driving every road in Montgomery township. Each structure was photographed, marked and labeled on a map, and superimposed on the aerial imagery. The landscape was examined for depressions, sink holes, proximity to intermittent creeks, and existing rivers. This reconnaissance work was completed in the late spring and early summer when typical rains produce runoff and new green vegetation allows for more obvious indicators of water.

From the thorough investigation of properties in Montgomery Township, the driving of every road, and the evaluation of aerial photographs, initially 35 possible spring houses were identified and plotted in a GIS. The remote, rural nature of some buildings made it impossible to get permission to enter every property, and thus a systematic visual approach was applied to catalog the structures. Several old farm houses had evidence of structures that had characteristics of spring houses, but had been abandoned, overgrown with vegetation, or were in such decay that they were not calculated in the final analysis. Figure 2 displays the total number of possible houses (35) along with the 22 confirmed spring houses. Thirteen questionable structures were removed from the remainder of the study.

The 22 confirmed spring houses ranged in size, shape, materials, time periods, and uses. Some had been completely abandoned and were located in low, wet spots in farm fields and overgrown with lush vegetation. Others were attractive landscaped features in people's yards, decorated with wreaths, window baskets, and plantings.

Several spring houses showed evidence of multiple-uses and improvements over time particularly with the investments of modern windows and new roofing.

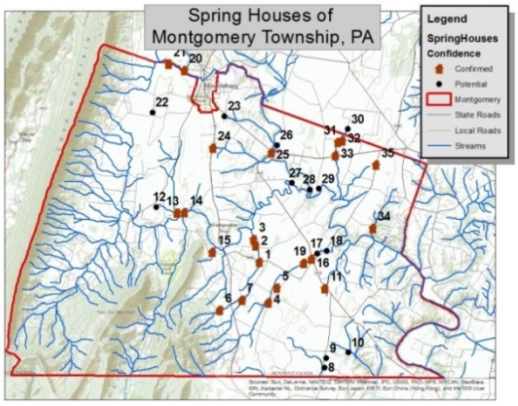

Figure 2: Location of spring houses and confirmed spring houses in Montgomery Township.

Figure 3 is an example of a large, detached spring house that measured 20 x 30 feet. The basement has two rooms with a trough of flowing water with ample room for cold storage and food preservation. The foundation walls have small slits possibly for ventilation or defense from Indian attacks, and the walls display evidence of high flood marks. The second floor contains a front kitchen with a fire place, a back bedroom, and a sitting room with another fire place. The stairs lead to a third floor loft, divided into two rooms. The cool basement is still used in hot summers, and the current tenants have not seen it dry up in over 50 years. On the other extreme, Figure 4 shows photographs from a small attached spring house. This house measures 7 feet wide by 7 feet 8 inches long, and it is attached to the basement of the main farm house. The upper right photo displays the house's foundation built directly into the fracture of the limestone rock, surrounded by tall grasses and flowing water. Inside the small spring house is a concrete trough, similar to the one in the large spring house, and a cup providing evidence of use.

Figure 3: An example of a large spring house.

In order to better understand the characteristics of spring houses remaining in Montgomery Township, architectural components were cataloged. Borrowing components commonly used in barn architecture, the spring houses were inventoried, and each spring house was given a number that linked it to the GIS map. Each house was given a relative size (small, medium, or large), shape (square or rectangle), and number of floors or stories it

Figure 4: Example of a small, attached spring house built into a limestone fracture.

contained. The outside of the building was identified as banked/below grade or sitting on the surface, freestanding or connected to other buildings, and their rooflines were considered to be either symmetrical, overhanging, or a single slanted plank. The houses were viewed to be in good, moderate, or poor condition. The building material above the stone foundations was classified as stone, log, brick, or combination and whether this was the same building material as the farm house. The number of chimneys and doors was calculated and the presence of windows was noted. The summary of 17 spring houses is listed in Table 1. The remaining 5 spring houses were too abandoned, overgrown, or in disrepair that they could not adequately be inventoried.

Table 1: Building components of 17 spring houses identified in study

MapID	Size	Shape	Floors	Banked	Roofline	condition	materials	Farmhouse	Chimney	doors	window
1	large	rec.	3	yes	overhang	good	wood	different	1	2	yes
2	large	rec.	3	no	overhang	good	brick	same	2	4	yes
3	small	squ.	1	no	one-slant	moderate	wood	same	0	1	yes
4	medium	rec.	1	no	asymmetrical	poor	stone	same	0	1	yes
5	large	rec.	3	no	symmetrical	good	stone	same	2	1	yes
6	small	squ.	1	no	symmetrical	good	stone	different	0	1	yes
10	small	rec.	1	yes	symmetrical	poor	stone	different	0	1	no
13	small	squ.	1	yes	asymmetrical	poor	stone	different	0	2	yes
14	small	squ.	1	yes	symmetrical	poor	stone	different	0	1	no
16	small	squ.	1	yes	symmetrical	good	stone	different	1	1	no
19	small	rec.	1	no	symmetrical	good	stone	same	0	1	no
20	small	rec.	1	no	symmetrical	moderate	stone	different	0	1	no
21	small	squ.	1	no	symmetrical	moderate	stone	different	0	1	yes
26	medium	squ.	1	no	symmetrical	moderate	stone	same	1	1	yes
30	medium	squ.	1	no	symmetrical	good	stone	same	0	1	no
31	large	rec.	2	no	symmetrical	moderate	stone	same	0	2	yes
33	large	rec.	3	yes	symmetrical	good	stone	same	1	1	yes

THE PHYSICAL ENVIRONMENT

This study assumes the natural environment played a large role in selecting a location for early settlement, and thus several key geographic features are displayed in the GIS. Figure 6 displays the location of spring houses along with the bedrock geology, streams, and karst features. The majority of the small runs, hollows, and creeks traverse the township in a northeasterly direction, starting in the mountainous areas in the west and flowing into the Conococheague River which forms the eastern border of the township. The karst features were generated by the Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources (DCNR) in 2007. The presence of potential karst features and surface runoff of the small tributaries would have been a potentially important water sources for earlier settlers.

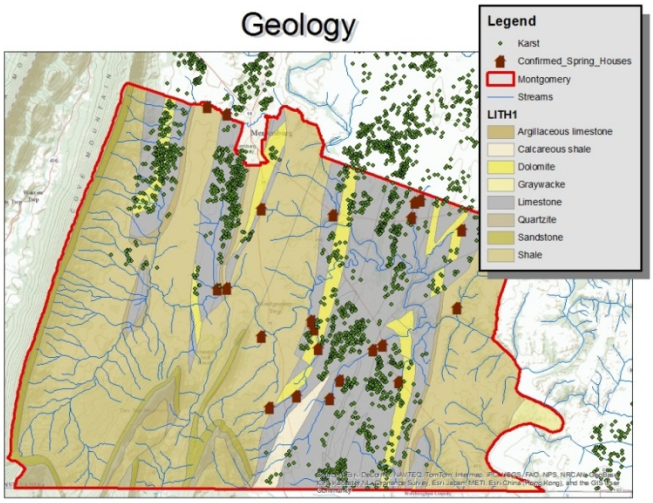

Figure 6: Location of spring houses on the underlying geologic bedrock, streams, and karst features.

THE HISTORICAL ENVIRONMENT

As previously mentioned the exact date of settlement west of the Susquehanna River was a multistep process and many properties took years, if not decades, to fully settle, survey, and warrant. With such historic data, some inaccuracies may occur in reconstructing every individual property in Montgomery Township however the 'First Families of Cumberland County' maps and books provide a useful tool in acquiring the overall historical pattern. The books list the names and dates of people registering deeds, warrants, and west side applications. The researchers used the systematic assumption that whichever was the earliest of those dates indicated a year where an initial investment in a property was made, and thus termed the attribute "first recorded date." Data from Volume 19 (Williamson Mason-Dixon) and Volume 22 (Mercersburg Kasieville) containing the first recorded date and settlers' surnames of Montgomery Township were joined to the property boundaries digitized from the topographic maps. The historic data was plotted with the spring house locations to determine temporal and ethnic patterns.

DISCUSSION

The initial goal of this project was to identify and inventory the architectural components of spring houses similar to the barn research that indicates European settlement in the New World. However, only broad commonalities can be generalized. Five of the spring houses had been completely abandoned or overgrown with vegetation that their components could not be classified. Of the remaining 17 most of them (9) were small rectangular buildings with symmetrical roofs. Two of the large spring houses had overhanging roofs with multiple

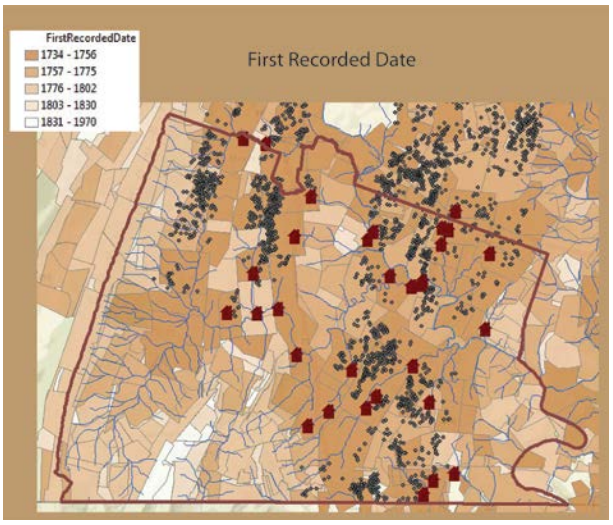

Figure 7: Property Boundaries and dates listed in "The First Families of Old Cumberland County".

doors and two chimneys which indicates a multifunctional building. The overhangs enclosed porches, and the two chimneys indicate food preparation and living quarters. Inside one of the larger spring houses there is evidence of a blacksmith shop. Two of the large spring houses have wide-arched doorways which may have allowed for barrels to pass through, not surprising in an area where whisky was an important commodity. The largest of the spring houses has been renovated and modernized and is currently being used for residential purposes. Eight of the spring houses were made from materials different than the farmhouse, mostly with the spring house being made out of limestone and the farmhouse made out of wood, siding, or brick. This indicates that the farmhouse has been renovated or replaced using newer building materials. Interestingly in another location, the farmhouse was constructed of grey limestone and the spring house was of red sandstone. The prevalence of sandstone in the nearby mountains makes this feasible, but the close proximity of the two buildings on the property makes it uniquely apparent. Unlike the alignment of barns to farmhouses which creates an esthetically appealing sense of order, spring houses have no such cardinality. Instead their position appears to be entirely in connection to the physical environment. Even the small spring houses are quaint buildings and are more substantial than just a small protective covering over a natural spring. The surviving spring houses of Montgomery Township are well-crafted buildings, intended to store lots of perishable foods, often serving as a place for utilitarian chores with butchering and cooking facilities, and in several cases had upstairs living quarters. Possibly, due to living in fear of Indian attacks and hardships endured on the frontier, settlers tried to contain as many components of living under one structure rather than going outside. On a purely practical note, having fresh running water in close proximity to butchering and cooking makes life much easier than moving between places or buildings.

The mapping of the 22 confirmed spring houses in Montgomery Township along with physical and historical features was an attempt to analyze clusters of spring houses in particular areas. Overwhelming evidence suggests the earliest settlers preferred limestone properties near small streams and creeks. While only slightly more than half (13 out of 22) of the existing spring houses fall within the limestone geology, and only 7 of the 22 fall within 100 feet of a stream, all 22 fall within both. Thus all the spring houses are either located on limestone or are within 100 feet of a stream. Historically those earliest claimed lands contained numerous karst features. Today lands with sink holes are often watched or avoided, but historically they were the first to be settled. Nearly 70% (935 out of 1347) of the karst features are located on properties settled in the first twenty years, and 97.6% (1315 of 1347) were settled by 1775.

Interestingly, the spring houses are located near the headwaters of small creeks originating in the valley. However as those tributaries join together to form the main river, the Conococheague, no spring houses remain. Perhaps farther downstream the creeks were large enough year round to provide plenty of water that settlers did not feel the need to protect their water source. Unlike studies to the north where the earliest settled properties were highly correlated to the large river that flows into the Susquehanna River, settlement in Montgomery Township did not occur along the Conococheague first. Instead, most of the central part of the valley was settled by the mid-1700s

whereas most of the properties along the Conococheague were not settled until after 1800. Despite the size and importance of this major river, it is possible that the border dispute between Maryland may have impacted economies and flow of goods during initial settlement, or perhaps the underlying rock type was more important. The Conococheague flows through shale and siltstone and would have been harder to farm.

Most of the surviving spring houses are located in the clustering of properties claimed in the first twenty years of settlement. Montgomery Township contains 324 of the First Families of Cumberland County properties, of which nearly a quarter of them, 72 or 22.2%, have an initial recorded date ranging from 1737-1756. In addition 15 of the 22 (68%) confirmed spring houses reside on these earliest settled properties. By 1775 over 161 properties claimed most of the agricultural valley with properties housing 17 of the 22 (77%) of the confirmed spring houses. While the spring houses do not necessarily date to this time, the land was claimed, cleared, and seen as ideal homestead with qualities worthy of investments.

The nationalities of the names recorded on the properties with surviving spring houses reflect the Scots-Irish, and Welsh settlement of the region. The initial warrants went to names such as David Davies, James Campbell, Thomas Cooper, John McClellan, Robert McCoy, and Thomas Johnston. Interestingly, one property was warranted to a woman Rebecca McCarnish. Over time however, land transactions and recorded surveys reflect the decline of the Scots-Irish settlers and influx of German immigrants. For example, one of the larger properties that contain three of the remaining spring houses was first warranted to Thomas Evans in 1740. Over the next 80 years the property was either purchased or subdivided numerous times and the names reflected on the surveys indicate the transition of ownership from Scots-Irish to German immigrants. In 1789 the property was warranted to Samuel Daugherty, in 1792 to Henry Schneider, in 1814 to Daniel Stoufer, and in 1819 to Jacob Sibert.

CONCLUSIONS

By mapping and inventorying the spatial patterns of existing spring houses, and understanding their connection with the physical landscape and historical settlement patterns this research intends to lay the foundation for a better understanding of early colonial settlement and develop awareness for a significant historical resource. By identifying a region with numerous surviving spring houses and correlating their existence with environmental factors this project's aim was to bring awareness of an often overlooked structure to help people identity, manage, and find links to previous settlement patterns and possibly its diffusion. Further research into the origin of spring houses and possible adoption in later settled areas such as Kentucky may reveal interesting insights into European settlement and its diffusion. Spring houses reinforce how essential water is to people's existence and these quaint, beautiful architectural structures should be identified and preserved. Spring houses remain as a testament to early settlement and contribute to a rich cultural landscape.

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